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**ECONOMIC ANALYSIS
OF CRITICAL HABITAT DESIGNATION
FOR THE PIPING PLOVER:
WINTERING HABITAT**

(Revised)

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TABLE OF CONTENTS

PREFACE	P-1
EXECUTIVE SUMMARY	ES-1
SECTION 1	
INTRODUCTION	1
1.1 Consultation under Section 7 of the Endangered Species Act	2
1.2 Purpose and Approach of Economic Assessment	4
1.3 Structure of Report	5
SECTION 2	
DESCRIPTION OF SPECIES AND PROPOSED CRITICAL HABITAT AREAS	7
2.1 Species Description	7
2.2 Constituent Elements of Critical Habitat and Potential Disturbances	8
2.3 Proposed Critical Habitat Units	10
2.3.1 Federal Lands	12
2.3.2 State Lands	12
2.3.3 Private Lands	12
2.4 Relevant Baseline Information	13
2.4.1 Federal Programs	13
2.4.2 State Regulations	15
2.4.3 Socioeconomic Profile of Designated Area	21
SECTION 3	
ANALYTIC FRAMEWORK AND RESULTS	24
3.1 Framework for Analysis	24
3.1.1 Methodological Approach	24
3.1.2 Categories of Economic Impact	26
3.1.3 Information Sources	27
3.2 Potential Consultation Costs Due to Critical Habitat	28
3.2.1 Cost Categories for Section 7 Consultations in Critical Habitat	29
3.2.2 Consultation Cost Estimates	30
3.3 Cost Scenarios by Activity Type	33
3.3.1 Housing and Commercial Development: Case Study of Development in	

Southern Texas	33
3.3.2 Dredging and Disposal: Case Studies of Corps Permitting	36
3.3.3 Beach Nourishment Activities: Case Study from Savannah District	42
3.3.4 Tourism and Recreation	44
3.3.5 Oil and Gas Exploration	45
3.3.6 Waterway Operations	46
3.4 Additional Impacts Due to Critical Habitat	47
3.4.1 Potential Impacts on Small Businesses	47
3.4.2 Environmental Justice Concerns	48
3.5 Potential Benefits of Proposed Critical Habitat	51
OTHER REFERENCES	56
 APPENDIX A	
DESCRIPTION OF CRITICAL HABITAT UNITS	A-1
 APPENDIX B	
CRITICAL HABITAT UNIT MAPS	B-1

PREFACE

1. This report was prepared for the U.S. Fish and Wildlife Service (the Service) by Industrial Economics, Incorporated (IEc) to assess the economic impacts that may result from designation of critical habitat for wintering piping plovers. Under section 4(b)(1) of the Endangered Species Act (Act), the decision to list a species as endangered or threatened is made solely on the basis of the best scientific and commercial data available. Section 4(b)(2) of the Act states that the decision to designate critical habitat must take into consideration the economic impact, and any other relevant impact, of specifying a particular area as critical habitat. As such, this report does not address any economic impacts associated with the listing of the species, but aims to address those economic impacts potentially resulting from the designation of critical habitat for wintering piping plovers. Furthermore, this revised analysis was prepared and updated after comments on the draft analysis were received but before any changes in designation were finalized. Therefore, the critical habitat units that are analyzed here and described in Appendix A refer to the designation in the proposed rule. The aim of this approach is to ensure that the Service considers the impacts in the proposed rule before making changes in the designation and publishing the final rule.
1. Section 7 of the Act authorizes the Service to consider, and, where appropriate, make a determination that a Federal agency action is likely to jeopardize the continued existence of a species or result in the destruction or adverse modification of critical habitat. IEc, therefore, also requested input from Service officials concerning whether or not any of these projects would likely result in *an adverse modification determination without an accompanying jeopardy opinion*. It is important to note here that it would not be appropriate for IEc to make such policy determinations.
1. This report represents characterization of possible economic impacts associated with the designation of critical habitat for wintering piping plovers. To understand the concerns of stakeholders, IEc solicited opinions from the Service and other Federal and state agencies regarding current and potential uses of land within the proposed critical habitat, potential Federal nexuses, historical consultations regarding the wintering piping plover, the potential for future consultations, and the potential costs associated with possible future consultations. Using this information, this report characterizes the impacts likely to be associated with the designation of critical habitat for wintering piping plovers.

EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the economic impacts that would result from the proposed critical habitat designation for wintering piping plovers (*Charadrius melodus*). This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service's (the Service) Division of Economics.¹
1. Section 4(b)(2) of the Endangered Species Act (the Act) requires the Service to designate critical habitat on the basis of the best scientific and commercial data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Proposed Critical Habitat

1. The Service has proposed 146 units of critical habitat for the piping plover along the Southeastern and Gulf coasts. Eighteen of these units are in North Carolina, 15 in South Carolina, 16 in Georgia, 36 in Florida, 15 in Mississippi, three in Alabama, 7 in Louisiana, and 37 in Texas. The areal extent of the proposed units is 2,104,877 acres. The wintering population of the species was listed as threatened in 1985. Any existing structures within the critical habitat area, such as roads and buildings, which do not contain the constituent elements necessary to support this species, are not considered critical habitat. Exhibit ES-1 displays how the 2,104,877 acres of critical habitat for the piping plover are distributed across Federal, state, and private landholders. As shown, state land represents the greatest share, about two-thirds of all the habitat proposed. Note that open waters (ocean, rivers, bays) within the proposed units were considered state ownership. As discussed in Section 2, Federal and private land account for the majority of critical habitat when measured as linear shoreline. The Service considers all of the proposed units to be occupied by piping plovers.

Economic Impacts Considered

1. This analysis defines an impact of critical habitat designation to include any effect critical habitat designation has above and beyond the impacts associated with the listing of the piping plover. Section 9 of the Act makes it illegal for any person to "take" a listed species, which is defined by the

¹ The critical habitat units analyzed in this report and described in Appendix A refer to the designation as contained in the proposed rule. It is our understanding that the final designation may differ from that of the proposed rule.

Act to mean harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or the attempt to engage in any such conduct.² To evaluate the *increment* of economic impacts attributable to the critical habitat designation for the piping plover, above and beyond the ESA listing, the analysis assumes a “without critical habitat” baseline and compares it to a “with critical habitat” scenario. The difference between the two is a measurement of the net change in economic activity that may result from the designation of critical habitat for the piping plover.

Exhibit ES-1				
SUMMARY OF LOCATION AND OWNERSHIP PROPOSED CRITICAL HABITAT UNITS FOR WINTERING PIPING PLOVERS				
Total Area of Units Expressed in Acres				
	Federal	State	Private	TOTAL
North Carolina	16,504	39,331	6,511	62,346
South Carolina	3,917	17,660	3,427	25,004
Georgia	6,081	25,592	5,819	37,492
Florida	44,058	140,520	4,191	188,769
Alabama	415	2,565	3,857	6,837
Mississippi	70,083	45,756	6,299	122,138
Louisiana	127,207	955,660	201,268	1,284,135
Texas	145,192	171,529	61,435	378,156
Total	413,457	1,398,613	292,807	2,104,877

1. The "without critical habitat" baseline represents current and expected economic activity under all existing modifications prior to critical habitat designation. These include the take restrictions that resulted from the listing of the piping plover as well as other Federal, state, and local requirements that may limit economic activities in the regions containing the proposed critical habitat units. For example, the U.S. Army Corp of Engineers (the Corps) would still need to consult with the Service on wetland development projects that may affect a listed species to ensure the proposed activities do not jeopardize the continued existence of the species, regardless of the critical habitat status of the parcel. While there may be both current and future impacts attributable to the listing of the piping plover, such impacts are not the subject of this analysis.
1. This analysis recognizes that, even in cases where consultations would be expected in the absence of critical habitat, there are scenarios that could involve additional consultation costs. For example, (1) some consultations that have already been “completed” may need to be reinitiated to address critical habitat if the project is not completed; and (2) consultations taking place after critical habitat designation may take

² 15 U.S.C. 1531 et seq.

longer because critical habitat issues will need to be addressed. In addition, the economic impact of critical habitat designation can go beyond the direct costs of consultations and project modifications. For example, even in units for which critical habitat designation is not expected to impose further project modifications beyond those required by the listing of the piping plover, government and private landowners may nonetheless incur costs resulting from critical habitat designation above and beyond those attributable to the listing of the piping plover as a threatened species. These costs might include the value of time spent in conducting section 7 consultations beyond those associated with the listing of the piping plover, and/or delays in implementing public and private development activities with a Federal nexus, which may result in losses to individuals and society, among other costs.

1. To estimate the effect that critical habitat designation would have on existing and planned activities, the preparers of this report:

- C Collected information on current and planned land uses in proposed critical habitat areas for the piping plover;
- C Reviewed comments received from various stakeholders after the draft economic analysis was made public;
- C Identified whether a Federal nexus to expected economic activities in these units exists;
- C Requested stakeholders' opinions on: (1) whether each identified land use might be subject to modifications related to the listing of piping plovers; and (2) whether additional modifications might be imposed under the critical habitat designation.

1. The designation of critical habitat may also result in economic benefits. Resource preservation or enhancement, which is aided by designation of critical habitat, may constitute an increase in non-recreational values provided directly by the species and indirectly by its habitat. Categories of potential benefits associated with the designation include enhancement of wildlife viewing, increased biodiversity and ecosystem health, and intrinsic (passive use) values.³

Findings

³ Intrinsic values, also referred to as passive use values, include categories of economic benefits such as existence value, i.e., knowledge of continued existence of a resource or species; and bequest value, i.e., preserving the resource or species for future generations.

1. The initial scoping analysis revealed six activities that may be affected by the designation of wintering critical habitat for the piping plover. These activities are: i) residential and commercial shoreline development; ii) dredging and disposal of dredged materials; iii) beach nourishment; iv) oil and gas drilling exploration; v) recreational visitation of shoreline; and vi) waterway operations. Additionally, highway construction and disaster relief were also identified as activities that could merit consultations in a few units.

1. Based on a review of data on past consultations from respective field offices of the Service, as well as information from various stakeholders, this analysis estimates the number of formal consultations associated with these activities that might occur over the next 10 years within the critical habitat designation. Administrative costs for conducting these formal consultations were calculated for the entire listing area, using a cost model that has been applied to a number of critical habitat economic analyses. As shown on Exhibit ES-2, this analysis estimates that 165 formal consultations could occur over the next ten years, at a total cost of approximately \$1.4 million. While the Service believes, for all proposed units, that these consultations would have occurred regardless of critical habitat designation (i.e., they are most likely attributable to the listing of the species), various Federal action agencies may view the designation of critical habitat as providing new information and requirements. The estimated range presented in Exhibit ES-2 (i.e., one-half to twice the above value) is based on varying expectations of stakeholders regarding (1) whether specific consultations would have been required in the baseline (i.e., in the absence of critical habitat), (2) the number of expected consultations (including economic activity levels in the proposed units); and (3) whether these consultations would reach the "formal" stage.

1. Interviews with stakeholders and further research revealed that dredging and associated disposal of dredged material, beach nourishment and housing / commercial development are the only activities likely to result in project modification costs following section 7 consultations. The Service believes, for all proposed units, that these costs are most likely attributable to the listing of the species, due to the fact that they consider all of the proposed units to be occupied. However, as noted above, various Federal action agencies may view the designation of critical habitat as providing new information and requirements. Thus, this analysis presents upper-bound cost estimates, reflecting the assumption that some additional impacts may be experienced as a result of critical habitat designation.

1. Instead of attempting to cost-out each potential project modification, this analysis follows a case-study approach intended to provide reasonable upper-bound cost estimates for potential activities. We used a sampling of case studies provided by commenters and interviews with stakeholders with projects that had the requisite Federal nexus for our analysis. These case studies are intended for use by the Service in understanding the potential economic impact of critical habitat designation in a given unit, recognizing that (1) these costs may be attributable to the listing or other baseline requirement, (2) the described modifications may not be required.

1. Exhibit ES-2 summarizes the case study cost estimates for various categories of activities, based on this approach. This exhibit also provides an index of the units that might experience these categories of impacts. It is important to note that the Service and various stakeholders provided alternative points of view on the frequency of consultations, the attribution of any expected consultations and modifications to the listing versus designation of critical habitat, and the extent of any project modifications that might occur following a consultation. This analysis assumes that some additional consultations and modifications may ultimately be attributable to critical habitat designation, and that substantive requirements may be imposed on projects as a result of the designation, as reflected in the upper-bound estimates provided in Exhibit ES-2.

Exhibit ES-2 RESULTS OF ECONOMIC IMPACT ANALYSIS FOR CRITICAL HABITAT FOR WINTERING PIPING PLOVERS		
Activity	Cost scenarios* (to the nearest \$10,000)	Projected Impact in Critical Habitat*
Formal consultations (likely range of cost: one-half to twice the given values)	Cost over ten years to: Fish and Wildlife Service: \$500,000 Federal Agencies: \$680,000 Private Entities: \$230,000 Total: \$1,420,000	Total number of Formal Consultations by State: AL: 4, FL: 32, GA: 5, LA: 1, MS: 31, NC: 80, SC: 8, TX: 4 Total: 165
Housing and commercial development	Case study of Southern Texas: Upper-bound estimate of lost profits to developers over ten years: C 500 condominiums on South Padre Island: \$190,000 C 3000+ units on North Padre Island: \$1,190,000 C 5,000+ units on Pointe San Luis: \$3,210,000	Units potentially impacted: MS: 2 - 8 GA: 1,2,14 TX: 3, 5, 6, 34
Dredging and Disposal	Case studies with additional cost scenarios over next five years: <i>St. Lucie Inlet, FL</i> C Upper-bound: \$760,000 in costs for pumping dredge to new location. C The Service believes that it is highly improbable that this type of project would require a modification associated with the plover, since sand is usually reworked by wave action and unlikely to affect critical habitat. <i>Murrels Inlet, SC</i> C Upper-bound: \$640,000 in cost for pumping dredge to new location. C The Service believes that it is highly improbable that this type of project would require a modification associated with the plover, since dredged sand may in fact provide valuable habitat for related species such as terns, Wilsons plovers and the threatened seabeach amaranth.	Units potentially impacted: AL: 2 FL: 25, 33 MS: 5,9-11,14,15 NC: 1,4-6,8-13, 14, 16-18 SC: 3, 9 TX: 3

Exhibit ES-2

**RESULTS OF ECONOMIC IMPACT ANALYSIS FOR
CRITICAL HABITAT FOR WINTERING PIPING PLOVERS**

Activity	Cost scenarios* (to the nearest \$10,000)	Projected Impact in Critical Habitat*
Beach nourishment and restoration	Case study of <i>Tybee Island Restoration Project</i> , GA: C Upper-bound cost: \$1,050,000 annually C The Service believes that any modification is unlikely, since the berms are underwater and would not impact critical habitat.	Units likely to be impacted: FL: 6,7, 8, 10, 11 GA: 1, 2, 14 LA: 4, 5, 7 MS: 3-8, 11 NC: 4,6,10,12,16-18 SC: 5,6,13,15
Oil and gas drilling and exploration	No project modifications expected. Only consultation costs are expected.	Units potentially affected: FL: 2,3,5-9 MS: 4,6,7,9,13,14 NC: 1,9,10 TX: 3
Tourism and recreation	No project modifications expected. Only consultation costs are expected.	Units potentially affected: FL: 2, 7 NC: 1-15 SC: 9
Waterway operation	No project modifications expected. Only consultation costs are expected.	Units potentially affected: LA: 4, 5, 7 SC: 3 TX: 3 (concerns largely addressed through dredging consultations)
* The Service does not believe that the projected impacts and associated costs are attributable to Critical Habitat and maintains that such impacts are attributable to the listing (as indicated in the Final Rule for the designation).		

INTRODUCTION

SECTION 1

1. On December 11, 1985 the Service published a final rule listing the piping plover as endangered in the Great Lakes watershed and threatened elsewhere within its range (50 FR 50720). On December 4, 1996, Defenders of Wildlife filed a lawsuit⁴ against the U.S. Department of the Interior (DOI) and the Service for failing to designate critical habitat for the Great Lakes breeding population of the piping plover. Defenders filed a second similar suit for the Northern Great Plains piping plover population in 1997. These lawsuits were subsequently combined (Defenders of Wildlife et al. v. Bruce Babbitt et al., Consolidated Cases Civil No. 1:96-CV-02695AER and Civil No. 1:97-CV00777AER). On February 7, 2000, the U.S. District Court for the District of Columbia issued an order directing the Service to propose critical habitat for Great Lakes population of the piping plover by June 30, 2000 and a similar proposal was ordered for the Northern Great Plains population by May 31, 2001. A subsequent order required that the critical habitat designation for the Great Lakes population and its wintering habitat be finalized by April 30, 2001 and for the Northern Great Plains population by March 15, 2002.
1. The wintering population of piping plovers is listed as a threatened species while the breeding population is endangered. Since the Service cannot distinguish the Great Lakes and Great Plains birds on their wintering grounds, they felt it was appropriate to propose critical habitat for all U.S.-wintering piping plovers collectively. Further, they determined that the appropriate course of action would be to propose critical habitat for all U.S.-wintering piping plovers on the same schedule required for the Great Lakes breeding population.
1. Critical habitat designation can help focus conservation activities for a listed species by identifying areas, that contain the physical and biological habitat features that are essential for the conservation of the species. The Act defines critical habitat as areas that contain "those physical or biological features (1)

⁴ *Defenders of Wildlife and Piping Plover v. Babbitt*, Case No. 96CV02965

essential to the conservation of the species and (2) which may require special management considerations or protection."⁵ The Service can designate areas outside the geographical area presently occupied by a species as critical habitat, only when a designation limited to its present range would be inadequate to ensure the conservation of the species. This rule proposes to designate occupied habitat only.

1. Critical habitat designation contributes to Federal land management agencies' and the public's awareness of the importance of these areas. However, the designation of critical habitat has no effect on private actions on private lands unless a Federal connection (or "nexus") to a land use or management action exists, such as funding, permit authorization, or other Federal actions. In addition to its informational role, the designation of critical habitat may provide protection where significant threats to the species have been identified (particularly in areas that are not technically occupied by the species). This protection derives from section 7 of the Act, which requires Federal agencies to ensure that activities they fund, authorize, or carry out are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat.

1.1 CONSULTATION UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT

1. Section 7(a)(2) of the ESA requires Federal agencies to consult with the Service whenever activities they fund, authorize, or carry out may affect listed species or designated critical habitat. Section 7 consultation with the Service is designed to ensure that any current or future Federal actions do not appreciably diminish the value of the critical habitat for the survival and recovery of the species. Activities by individuals, organizations, states, local and Tribal governments only require consultation with the Service if their actions occur on Federal lands; require a Federal permit, license, or other authorization; or involve Federal funding. Federal actions not affecting the species or its critical habitat, as well as actions on non-Federal lands that are not Federally funded, authorized, or permitted, will not require section 7 consultation.
1. For consultations concerning activities on Federal lands, the relevant Federal agency consults with the Service. Where the consultation involves an activity proposed by a state or local government or a private entity (the "applicant"), the Federal agency with the nexus to the activity (the "Action agency") serves as the liaison with the Service. The consultation process may involve both informal and formal consultation with the Service.
1. Informal section 7 consultation is designed to assist the Federal agency and any applicant in identifying and resolving potential conflicts at an early stage in the planning process. Informal consultation consists of informal discussions between the Service and the agency concerning an action that may affect

⁵ Endangered Species Act 1973, Sec. 3 (5)(A)(i)

a listed species or its designated critical habitat. In preparation for an informal consultation, the applicant must compile all biological, technical, and legal information necessary to analyze the scope of the activity and discuss strategies to avoid, minimize, or otherwise affect impacts to listed species or critical habitat.⁶ During the informal consultation, the Service makes advisory recommendations, if appropriate, on ways to minimize or avoid adverse effects. If agreement can be reached, the Service will concur in writing that the action, as revised, is not likely to adversely affect listed species or critical habitat. Informal consultation may be initiated via a phone call or letter from the Action agency, or a meeting between the Action agency and the Service.

1. A formal consultation is required if the proposed action is likely to adversely affect listed species or designated critical habitat in ways that cannot be avoided through informal consultation. Formal consultations determine whether a proposed agency action is likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat. Determination of whether an activity will result in jeopardy to a species or adverse modification of its critical habitat is dependent on a number of variables, including type of project, size, location, and duration. If the Service finds, in their biological opinion, that a proposed agency action is likely to jeopardize the continued existence of a listed species and/or destroy or adversely modify the critical habitat, the Service may identify reasonable and prudent alternatives that are designed to avoid such adverse effects to the listed species or critical habitat.
1. Reasonable and prudent alternatives are defined at 50 CFR 402.02 as alternative actions that can be implemented in a manner consistent with the intended purpose of the action, that are consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Service believes would avoid jeopardizing the species or destruction or adverse modification of critical habitat. Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing reasonable and prudent alternatives vary accordingly. The Service indicates, however, that costs attributable to reasonable and prudent alternatives resulting from the section 7 consultation process would normally be associated with the listing of a species, as it is unlikely that the Service would conclude that an action would destroy or adversely modify critical habitat without also jeopardizing the continued existence of a listed species.
1. Federal agencies are also required to evaluate their actions with respect to any species that is

⁶ Many applicants incur costs to prepare analyses as part of the consultation package. These costs vary greatly depending on the specifics of the project. Major construction activities, as referred to in the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.), require that a biological assessment be completed prior to informal consultation. In most cases, these costs are attributable to the fact that a species has been added to the list of threatened and endangered species rather than the designation of critical habitat.

proposed as endangered or threatened and with respect to its proposed or designated critical habitat. Regulations implementing the interagency cooperation provisions of the ESA are codified at 50 CFR part 402. Section 7(a)(4) of the ESA and regulations at 50 CFR 402.10 require Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a proposed species or to result in destruction or adverse modification of proposed critical habitat.

1.2 PURPOSE AND APPROACH OF ECONOMIC ASSESSMENT

1. Under Section 4(b)(2) of the ESA, the Secretary of the Interior is required to designate critical habitat on the basis of the best scientific and commercial data available and to consider the economic and other relevant impacts of designating a particular area as critical habitat. The Secretary may exclude areas from critical habitat upon a determination that the benefits of such exclusions outweigh the benefits of specifying such areas as critical habitat and exclusion will not result in the extinction of the species.
1. The purpose of this report is to identify and analyze the potential economic impacts that would result from the proposed critical habitat designation for wintering piping plovers.⁷ The analysis was conducted by assessing how critical habitat designation for the piping plover may affect current and planned land uses and activities on Federal and other government-held land as well as privately-held land. For Federally-managed land, designation of critical habitat may modify land uses, activities, and other actions that threaten to adversely modify habitat. For land held or managed by other governments or private entities subject to critical habitat designation, modifications on land uses and activities can only be imposed when a "Federal nexus" exists (i.e., the activities or land uses of concern involve Federal permits, Federal funding, or other Federal actions). Critical habitat has no effect on activities on state and private lands that do not involve a Federal nexus.
1. In addition to determining whether a Federal nexus exists, the analysis must distinguish between economic impacts caused by the ESA listing of the piping plover and those additional effects that would be caused by the proposed critical habitat designation. *The analysis attempts to evaluate economic impacts related to the proposed critical habitat designation that are above and beyond impacts related to the listing of the piping plover.* Finally, in the event that a land use or activity would be limited or prohibited by another existing statute, regulation, or policy, the economic impacts associated with those limitations or prohibitions would not be attributable to critical habitat designation.
1. To evaluate the increment of economic impacts attributable to the designation of critical habitat,

⁷ The critical habitat units analyzed in this report and described in Appendix A refer to the designation as contained in the proposed rule. It is our understanding that the final designation may differ from that of the proposed rule.

above and beyond the listing, the analysis assumes a "without critical habitat" baseline and compares it to a "with critical habitat" scenario, measuring the net change in economic activity. The "without critical habitat" baseline represents current and expected economic activity under all existing modifications prior to the designation of critical habitat. Only those actions that may be affected by modifications and costs due to critical habitat designation, above and beyond existing modifications, are considered in this economic analysis. Moreover, actions must be "reasonably foreseeable," defined as activities which are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public.

1. To estimate the effect that critical habitat designation would have on existing and planned activities, the preparers of this report:

- # Collected information on current and planned land uses in proposed critical habitat areas for the piping plover;
- # Reviewed comments received from various stakeholders after the draft economic analysis was made public;
- # Identified whether a Federal nexus to expected economic activities in these units exists;
- # Requested stakeholders' opinions on: (1) whether each identified land use might be subject to modifications related to the listing of piping plovers; and (2) whether additional modifications might be imposed under the critical habitat designation.

1.3 STRUCTURE OF REPORT

1. The remainder of this report is organized as follows:

- C Section 2: Species Description and Relevant Baseline Information -** Provides general information on the species, a brief description of the proposed critical habitat units, and regulatory and socioeconomic information describing the baseline (i.e., the "without critical habitat" scenario).
- C Section 3: Analytic Framework and Results -** Describes the framework and methodology for the analysis, the information sources used, and presents the findings of the analysis.

- C** **Appendix A: Unit Description by State** - Provides a brief description of each of the proposed critical habitat units.

- C** **Appendix B: Maps of Critical Habitat Areas** - Provides maps of the proposed critical habitat units.

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